

CLAIMS:

- 5 1. A process for the recovery of nickel and cobalt from laterite ores, the process including the steps of:
- a) beneficiating the ore to separate it into a beneficiated upgraded ore fraction and a coarse, siliceous low grade rejects fraction which is substantially free from fines and clay materials;
- 10 b) separately processing the upgraded ore fraction for the recovery of nickel and cobalt; and
- c) subjecting the low grade rejects fraction to a heap leach process with an acid supplemented solution to create a heap leachate for further nickel and cobalt recovery processing.
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2. A process according to claim 1, wherein the low grade rejects fraction is further treated as part of the beneficiation process to remove substantially all the fines and clay materials.
- 20 3. A process according to claim 1 wherein the nickel and cobalt is recovered from the upgraded ore fraction by high pressure acid leaching or atmospheric pressure agitation leaching, or a combination of both, to produce a leach solution for further processing.
- 25 4. A process according to claim 1 wherein the heap leachate from the low grade rejects fraction is blended with the leach solution from the acid leaching of the upgraded fraction to produce a blended leachate.
- 30 5. A process according to claim 1 wherein the low grade rejects heap leachate is further processed for nickel and cobalt recovery, independently from the leach solution from the upgraded ore fraction.

6. A process according to claim 4 and 5 wherein the nickel and cobalt is recovered from either the blended leachate or the low grade rejects heap leachate by precipitation of a sulphide or mixed hydroxide, treatment by solvent
5 extraction, by ion exchange or by other known metallurgical processing routes.

7. A process for the recovery of nickel and cobalt from laterite ores, the process including the steps of:

- a) separating the ore into a limonite fraction and saprolite fraction;
- 10 b) beneficiating the limonite and saprolite fractions independently to produce upgraded ore fractions and coarse, siliceous low grade rejects fractions which are substantially free from fines and clay material;
- c) independently or together processing the upgraded ore fractions;
- d) forming separate heaps of the low grade limonite and the low grade
15 saprolite rejects fractions; and
- e) subjecting the separate low grade limonite and the low grade saprolite rejects heaps to a heap leach process with an acid supplemented solution to create separate limonite and saprolite heap leachates for further nickel and cobalt recovery processing.

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8. A process according to claim 7 wherein the nickel and cobalt are recovered from the upgraded ore fractions by processing them together or independently by high pressure acid leaching, atmospheric pressure agitation leaching or a combination of both, to produce a leach solution for further
25 processing.

9. A process according to claim 7 wherein the limonite and saprolite heap leachates are blended with the leach solution from the acid leaching of the upgraded ore fractions to create a blended leachate for further nickel and cobalt
30 recovery processing.

10. A process according to claim 7 wherein the limonite and saprolite heap leachates are further processed either independently or together for nickel and cobalt recovery, separately from the leach solution from the upgraded ore fraction.
11. A process according to claim 10 wherein the nickel is recovered from the blended leachate or the limonite and saprolite heap leachates by precipitation as a sulphide or mixed hydroxide, treatment by solvent extraction, by ion exchange or by other known metallurgical processing routes.
12. A process according to claim 7 wherein the limonite heap leachate from the low grade limonite rejects heap is passed through the whole, or a part of the low grade saprolite rejects heap to assist in neutralizing the acid content and precipitate some of the dissolved iron in the resultant heap leachate.
13. A process according to claim 12 wherein the resultant heap leachate from the low grade rejects fraction is blended with the leach solution from the acid leaching of the upgraded fraction to produce a blended leachate.
14. A process according to claim 12 wherein the resultant leachate is further processed for nickel and cobalt recovery, independently from the leach solution from the upgraded ore fraction.
15. A process according to claim 13 or 14 wherein the nickel and cobalt is recovered from the blended leachate or the resultant heap leachate by precipitation of a sulphide or mixed hydroxide, treatment by solvent extraction, by ion exchange, or by other known metallurgical processing routes.

16. A process according to any one of the preceding claims wherein the acid supplemented solution is a solution of acidified water, sea water, underground brine or acidified waste solution for the acid leach of the upgraded ore fraction.

5 17. A process according to claim 1 wherein the beneficiation rejects fraction has from about 0.3% to 0.7% nickel and 0.01% to 0.03% cobalt.

18. A process, according to claim 1 substantially as hereinbefore described with reference to any one of the examples.